

FUNGI THAT ENTRAP NEMATODES UTILIZING NONCONSTRUCTING RINGS

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Almost all soil nematodes gradually taper from the middle of their bodies to their extremities. This characteristic makes them vulnerable to entrapment by a nonconstricting ring which, when entered by a nematode, will seat snugly on that part of the body too large for the ring to pass (Fig. 1). Fungi that produce nonconstricting rings include *Dactylaria candida* (Nees) Sacc. (3), *Dactylella leptospora* Drechs. (3), and *Monacrosporium lysipagum* (Drechs.) Subram. (2,3). Nonconstricting rings are also found in *Anulopodium nematogenum* Sherbakoff (4). However, *Anulopodium* is an erroneously erected genus that includes hyphomycetes with mistakenly identified circular conidia, which are actually detachable trapping rings. Because no authentic conidia have been observed with this fungus, it cannot be positively identified. *A. nematogenum* probably corresponds to a species of *Dactylaria*.

Characterization: All species in this group possess septate mycelia, mucilaginous trapping knobs (Fig. 3), and nonconstricting rings (Fig. 1,3) composed of three to four septa (1) which may be poorly defined. Rings are borne on stalks (Fig. 1) usually composed of one or two cells. It is difficult to increase vegetative and trapping mycelia of this fungus on nematode-infested water agar. Conidiophores and conidia (Fig. 1) are rarely produced in culture.

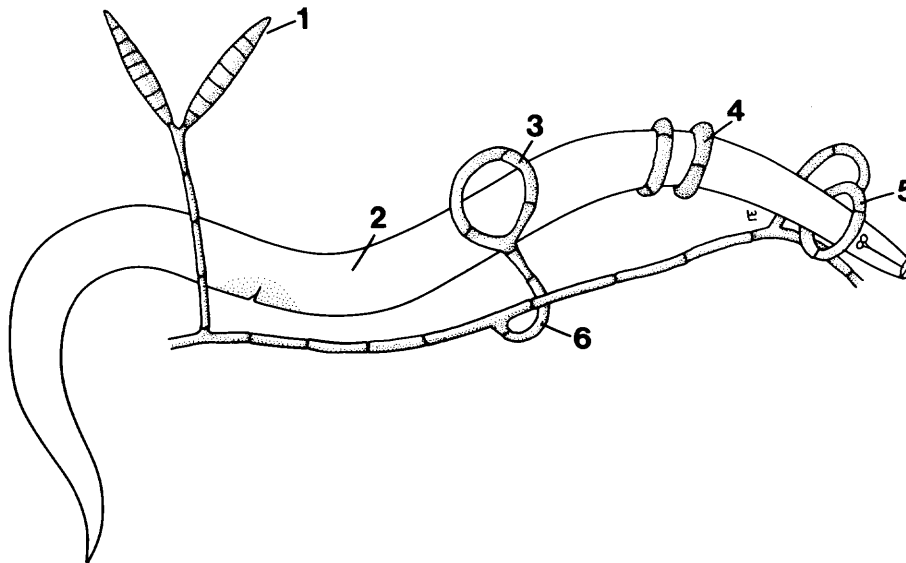


Fig. 1. A nematode entering a nonconstricting ring of *Dactylella leptospora*. 1) Conidia; 2) Nematode body; 3) Nonconstricting rings; 4) Detached ring on body; 5) Nematode entering attached ring; 6) Stalk.

Entrapment: The habitat in the soil occupied by nematodes and trapping fungi consists of a three-dimensional labyrinth formed by soil mineral particles and organic debris. Most tunnels are slightly larger than the nematode body. A number of passages are smaller than the nematode body, and some constrict or dead end to inhibit or prohibit passage. As a consequence, most nematodes in soil must move in narrow, constricted spaces. Vegetative mycelia that emanate from a trapped, dead nematode carcass radiate in many directions from the body and enter crevices or passages where nonconstricting rings and adhesive knobs are produced. Nematodes that enter passages where a trap awaits have little chance of escaping, due to the close quarters. Nonconstricting rings usually detach from the stalk, pulled away by the forward thrust of the nematode body. Sometimes nematodes back into rings with their tail (Fig. 4). A nematode has been observed with as many as eight rings encircling its body (3). Rings attached to nematodes produce penetration pegs which pass through the nematode integument, and form haustoria. Eventually the entire nematode body is filled with mycelia. Vegetative mycelia emerging from the dead carcass produce more traps and/or conidiophores and conidia.

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Prey: Aphelenchus sp., Bunonema sp., Cephalobus sp., Plectus sp., Rhabditis sp., and dorylaims, as well as minute maggots have been trapped by fungi with nonconstricting rings. In Florida, the phytoparasitic nematodes Helicotylenchus sp. (Fig. 2) and Pratylenchus coffeae (Zimmerman, 1898) Filipjev & Steckhoven, 1941 (Fig. 5) have been entrapped by nonconstricting rings at a depth of 3 feet below citrus trees.

Economic Potential: The nonconstricting ring fungi are considered weak parasites that kill their nematode hosts very slowly (2). They have not been utilized as test subjects in known published biological control experiments.

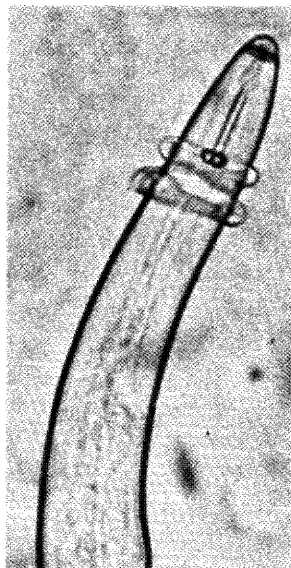


Fig. 2. Two nonconstricting rings fitted to the anterior end of Helicotylenchus sp.

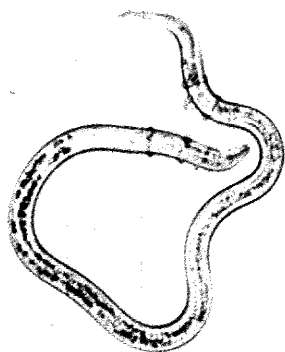


Fig. 4. A tylench larva with nonconstricting rings affixed at both ends of the body.

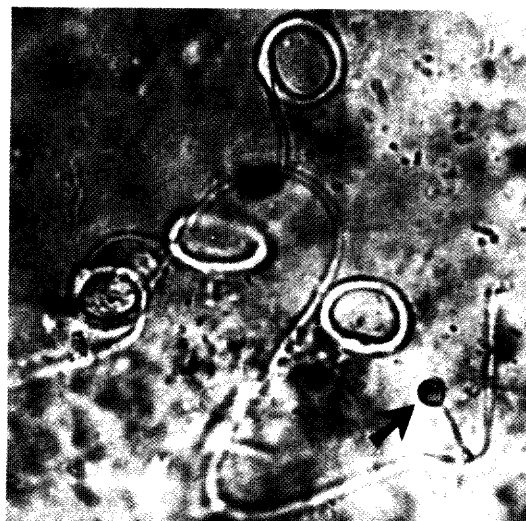


Fig. 3. Nonconstricting rings and a mucilaginous knob (arrow) on water agar.

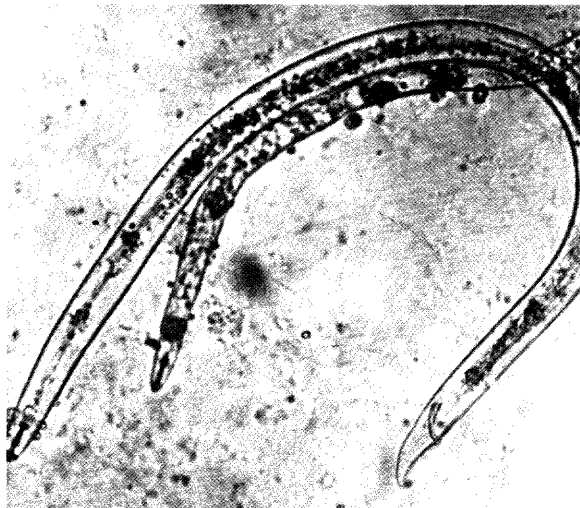


Fig. 5. A Pratylenchus coffeae male with 2 rings fitted just behind the head.

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